What Is Claimed Is:

1. A method of efficiently processing a discrete time input signal having a plurality of input signal samples that occur at a first clock rate into a discrete time output signal having a second clock rate that is R times the first clock rate, the method comprising the steps of:

receiving the input signal;

filtering the input signal with an N-taps finite impulse response (FIR) filter having N filter coefficients according to

$$\sum_{i=k}^{ceil[(N+1-k)/R]-1} b_{iR-k}\, u((m-i+k)T_s)$$

wherein b_{iR-k} is one of the N filter coefficients, and $u((m-i+k)T_S)$ is one of the input signal samples.

2. The method of claim 1, wherein the input signal is a position signal.

3. The method of claim 1, wherein each of the N filter coefficients is the result of a discrete convolution of a series of FIR filters.

4. The method of claim 1, wherein the output signal is sent to a control system that controls a photolithography scanning operation.

5. A system for efficiently processing a discrete time input signal having a plurality of input signal samples that occur at a first clock rate into a discrete time output signal having a second clock rate that is R times the first clock rate, the system comprising:

means for receiving the input signal;

means for filtering the input signal with an N-taps finite impulse response (FIR) filter having N filter coefficients according to

$$\sum_{i=k}^{ceil[(N+1-k)/R]-1} b_{iR-k}u((m-i+k)T_s)$$

wherein b_{iR-k} is one of the N filter coefficients, and $u((m-i+k)T_S)$ is one of the input signal samples.

6. The system of claim 5, wherein the input signal is a position signal.

7. The system of claim 5, wherein each of the N filter coefficients is the result of a discrete convolution of a series of FIR filters.

8. The system of claim 5, wherein the output signal is sent to a control system that controls a photolithography scanning operation.